AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

1. (Currently amended) A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) at a receiver comprising:

receiving a signal;

computing a CLTD weighting vector from the received signal;

providing the CLTD weighting vector to a transmitter; and

using the CLTD weighting vector, a channel estimate, and spreading codes for each user to suppress interference by producing an estimate of the signal transmitted by the transmitter, wherein the estimates of~~for~~ the signal uses a zero forcing function expressed as:

$$y_{ZF} = (A^H A)^{-1} A^H r, N_C Q \geq M ,$$

where r is the received signal, A is defined as $H\widetilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]$, H is the channel estimate, Nc is the spreading gain, Q is the number of received antennas, M is the number of multiple users, $\widetilde{W}$ is the weighting vector, $\sqrt{\rho_i}$ is the i-th power source, and Ci is the i-th spreading code.

2. (Canceled)

3. (Currently amended) The method of claim 1, wherein the computing of the CLTD weighting vector comprises:

calculating the[a] channel estimate from the received signal; and

computing the CLTD weighting vector based on the channel estimate.

4-5. (Canceled)

6. (Currently amended) The method of claim 1, wherein ~~the computation of~~ the estimates of~~for~~ the signal is implemented using a parallel or serial interference cancellation technique.

7-8. (Canceled)

9. (Currently amended) A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) at a receiver comprising:

receiving a signal;

computing a CLTD weighting vector from the received signal;

providing the CLTD weighting vector to a transmitter; and

using the CLTD weighting vector, a channel estimate, and spreading codes for each user to suppress interference by

equalizing the received signal; and

despreading the equalized received signal;

wherein equalizing~~estimates for~~ the received signal is~~are~~ expressed as

$$z_{ZF} = (\widetilde{W}^H H^H H \widetilde{W})^{-1} \widetilde{W}^H H^H r,$$

where r is the received signal, H is the channel estimate, and $\widetilde{W}$ is the weighting vector.

10. (Previously Presented) The method of claim 9, wherein the despreading applies the spreading codes from each user to the equalized received signal.

11. (Previously Presented) The method of claim 9, wherein the equalizing applies the CLTD weighting vector and the channel estimate to the received signal.

12-13. (Canceled)

14. (Currently amended) The method of claim 9, wherein an equalizer to perform the equalizing~~ation~~ is implemented as a bank of P*Q filters, wherein P is the number of transmit antennas and Q is the number of receive antennas.

15-18. (Canceled)

19. (Previously presented) The method of claim 45, wherein the despreading applies the spreading codes from each user to the equalized received signal.

20. (Original) The method of claim 19, wherein the despreading produces a symbol stream for each user.

21. (Previously presented) The method of claim 45, wherein the coherent combining applies the CLTD weighting vector to despread symbol intervals.

22. (Previously Presented) The method of claim 21, wherein the coherent combining further applies the channel estimate and spreading codes from each user.

23. (Currently amended) The method of claim 45, wherein an equalizer to perform the equalizing~~ation~~ is implemented as a bank of P*Q filters, wherein P is the number of transmit antennas and Q is the number of receive antennas.

24-29. (Canceled)

30. (Previously Presented) A receiver comprising:

a channel estimation unit coupled to a signal input, the channel estimation unit containing circuitry to calculate an estimate of a communications channel;

a weighting vector unit coupled to the channel estimation unit, the weighting vector unit containing circuitry to compute a computed weighting vector from the estimate of the communications channel;

a feedback unit coupled to the weighting vector unit, the feedback unit to provide the computed weighting vector back to a source of the received signal provided by the signal input;

a weight verification unit coupled to the channel estimation unit and the weighting vector unit, the weight verification unit containing circuitry to generate a comparison result by comparing the computed weighting vector with a received weighting vector received by the signal input; and

an interference resistant detection unit coupled to the signal input and to the weight verification unit, the interference resistant detection unit containing circuitry to use the estimate of the communications channel, spreading codes, and the weighting vector comparison result for interference resistance of the receiver, wherein the receiver receives signals from a plurality of users.

31-32. (Canceled)

33. (Previously Presented) The receiver of claim 30, wherein the interference resistant detection unit first equalizes the received signal and then despreads the equalized received signal.

34. (Previously Presented) The receiver of claim 30, wherein the interference resistant detection unit first equalizes the received signal, then despreads the equalized received signal, and then coherently combines the despread received signal.

35. (Canceled)

36. (Previously Presented) The communications system of claim 30, wherein the communications channel is a wireless communications channel.

37. (Original) The communications system of claim 36, wherein the communications system is a code-division multiple access (CDMA) communications system.

38. (Currently amended) The communications system of claim 36, wherein a~~the~~ transmitter transmits an~~the~~ encoded and spread data stream over multiple antennas.

39. (Currently amended) A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) comprising:

receiving a first signal at a receiver;

the receiver computing a first CLTD weighting vector from the first received signal;

the receiver providing the CLTD weighting vector to a transmitter;

receiving a second signal weighted by a second CLTD weighting vector at the receiver;

the receiver comparing the first and second CLTD weighting vectors; and

the receiver suppressing interference, using a channel estimate and spreading codes for each user, based on a result of the comparison of the first and second CLTD weighting vectors~~The method of claim 50~~, wherein the suppressing interference further comprises:

producing an estimate of the second signal transmitted by the transmitter, wherein estimates for the second signal use a minimum mean square error function expressed as:

$$y_{MMSE} = (A^H A + \sigma^2 \Lambda^{-1})^{-1} A^H r = \Lambda A^H (A \Lambda A^H + \sigma^2 I_{NN_cQ})^{-1} r,$$

where r is the received signal, A is defined as $H\widetilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]$, H is the channel estimate, Nc is the spreading gain, Q is the number of received antennas, M is the number of multiple users, $\widetilde{W}$ is the weighting vector, ρ_i is the i-th power source, $\Lambda = E[dd^H]$, I is the identity matrix, and Ci is the i-th spreading code.

40. (Currently amended) The method of claim 39, wherein the estimate for~~computation of the estimates for the~~ second signal is implemented using a parallel or serial interference cancellation technique.

41. (Canceled)

42. (Currently amended) A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) comprising:

receiving a first signal at a receiver;

the receiver computing a first CLTD weighting vector from the first received signal;

the receiver providing the CLTD weighting vector to a transmitter;

receiving a second signal weighted by a second CLTD weighting vector at the receiver;

the receiver comparing the first and second CLTD weighting vectors; and

the receiver suppressing interference based on a result of the comparison of the first and second CLTD weighting vectors~~The method of claim 51~~, wherein the suppressing interference further comprises:

producing an estimate of the second signal transmitted by the transmitter, wherein estimates for the second signal are expressed as:

$$z_{MMSE} = (W^H H^H H\widetilde{W} + (\sigma^2 / \mu) I_{NN_c})^{-1} \widetilde{W}^H H^H R$$
$$= \widetilde{W}^H H^H (H\widetilde{W}\widetilde{W}^H H^H + (\sigma^2 / \mu) I_{NN_cQ})^{-1} r,$$

where $\mu = \frac{1}{N_c}\sum_{k=1}^{M} \rho_k \varepsilon_k$, $\varepsilon_k = E[|d_k(n)|^2]$, r is the received signal, H is the channel estimate, $\widetilde{W}$ is the weighting vector, and I is the identity matrix.

43-44. (Canceled)

45. (Currently amended) A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) at a receiver comprising:

receiving a signal;

calculating a channel estimate from the received signal;

computing a CLTD weighting vector based on the channel estimate~~from the received signal~~;

providing the CLTD weighting vector to a transmitter; and

using the CLTD weighting vector, a channel estimate, and spreading codes for each user to suppress interference by:

equalizing the received signal;

despreading the equalized received signal by; and

coherent combining the despread equalized received signal, wherein ~~estimates for the signal are~~equalizing the received signal is expressed as:

$$z_{ZF} = (H^H H)^{-1} H^H r, \quad Q \geq P$$

where r is the received signal, H is the channel estimate, and Q is the number of received antennas.

46. (Previously Presented) The method of claim 52, wherein the suppressing interference further comprises:

producing an estimate of the second signal transmitted by the transmitter, wherein estimates for the second signal are expressed as:

$$z_{MMSE} = (H^H H + (\sigma^2 / \mu) I_{NN_c P})^{-1} H^H r$$

$$= H^H (HH^H + (\sigma^2 / \mu) I_{NN_c Q})^{-1} r$$

where $\mu = \frac{1}{N_c} \sum_{k=1}^{M} \rho_k \varepsilon_k$, $\varepsilon_k = E[|d_k(n)|^2]$, r is the received signal, H is the channel estimate, and Q is the number of received antennas, ρ_i is the i-th power source.

47-52. (Canceled)

53. (Currently amended) The receiver of claim 30, wherein the estimates of the communications channel~~for the signal~~ uses a zero forcing function expressed as:

$$y_{ZF} = (A^H A)^{-1} A^H r, N_C Q \geq M,$$

where r is a received signal, A is defined as $H\widetilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]$, H is an estimate of the communications channel, Nc is a spreading gain, Q is a number of received

antennas, M is a number of multiple users, $\widetilde{W}$ is a weighting vector, $\sqrt{\rho_i}$ is an i-th power source, and Ci is an i-th spreading code.